

AMENDMENTS TO THE CLAIMS

Please amend the claims as follows.

1. (Currently Amended) A localized plasmon resonance sensor comprising:

a sensor unit having a metal layer with a plurality of convex parts or concave parts formed by fixing metal particles having a diameter of between 10 and 30 nm at an interval of greater than or equal to two times and less than or equal to four times the diameter in average from each other on a surface of a transparent substrate, and molecule recognition functional substance for attaching a specific analyte immobilized on the substrate or the metal layer; and

a light emitting module configured facing a back surface of the transparent substrate, such that a light emitted by the light emitting module reaches the metal layer passing through the transparent substrate;

wherein the surface arranged with the metal layer and the molecule recognition functional substances of the sensor unit is contacted to an analysis sample solution containing analyte modified with [[a]] the light emitting molecule;

an evanescent light generated at the surface of the substrate by an excitation light irradiated at an incident angle totally reflected at the surface of the substrate onto the other surface of the sensor unit and the metal layer Plasmon resonate to locally intensify an electric field around the metal layer; and

presence or concentration of the analyte attached to the molecule recognition functional substance is measured by detecting a luminescent light excited and emitted from the light emitting molecule of the analyte attached to the molecule recognition functional substance among the analytes with the electric field.

2. (Canceled)

3. (Previously Presented) The localized plasmon resonance sensor according to claim 1, wherein a prism is arranged closely attached to the back surface of the substrate.

4. (Currently Amended) A localized plasmon resonance sensor comprising:

a sensor unit having a metal layer with a plurality of convex parts or concave parts formed by fixing metal particles having a diameter of between 10 and 30 nm at an interval of greater than or equal to two times and less than or equal to four times the diameter in average from each other on a surface of a transparent substrate, and molecule recognition functional substance for attaching a specific analyte immobilized on the substrate or the metal layer;

wherein the surface arranged with the metal layer and the molecule recognition functional substances of the sensor unit is contacted to an analysis sample solution containing analyte modified with a light emitting molecule;

an evanescent light generated at the surface of the substrate by an excitation light irradiated at an incident angle totally reflected at the surface of the substrate onto the other surface of the sensor unit and the metal layer Plasmon resonate to locally intensify an electric field around the metal layer; and

presence or concentration of the analyte attached to the molecule recognition functional substance is measured by detecting a luminescent light excited and emitted from the light emitting molecule of the analyte attached to the molecule recognition functional substance among the analytes with the electric field; and ~~The localized plasmon resonance sensor according to claim 1;~~

wherein a light detector for detecting the luminescent light is arranged by way of a lens on the side facing the surface arranged with the metal layer and the molecule recognition functional substances of the sensor unit.

5. (Currently Amended) A localized plasmon resonance sensor comprising:

a sensor unit having a metal layer with a plurality of convex parts or concave parts formed by fixing metal particles having a diameter of between 10 and 30 nm at an interval of greater than or equal to two times and less than or equal to four times the diameter in average from each other on a surface of a transparent substrate, and molecule recognition functional substance for attaching a specific analyte immobilized on the substrate or the metal layer;

wherein the surface arranged with the metal layer and the molecule recognition functional substances of the sensor unit is contacted to an analysis sample solution containing analyte modified with a light emitting molecule;

an evanescent light generated at the surface of the substrate by an excitation light irradiated at an incident angle totally reflected at the surface of the substrate onto the other surface of the sensor unit and the metal layer Plasmon resonate to locally intensify an electric field around the metal layer; and

presence or concentration of the analyte attached to the molecule recognition functional substance is measured by detecting a luminescent light excited and emitted from the light emitting molecule of the analyte attached to the molecule recognition functional substance among the analytes with the electric field; and

~~The localized plasmon resonance sensor according to claim 1,~~ wherein the emission wavelength of the light emitting molecule and the wavelength of the excitation light are different.

6. (Original) The localized plasmon resonance sensor according to claim 5, wherein a cut filter for shielding the excitation light is arranged in front of the light detector.

7.-11. (Canceled)

12. (Original) The localized plasmon resonance sensor according to claim 1, wherein the height and the width of the convex part or the concave part are both less than or equal to 150 nm.

13. (Currently Amended) The localized plasmon resonance sensor according to claim 1, wherein [[the]] a shape of [[the]] a metal fine particle is a sphere, an elliptical sphere, or one part of the sphere or the elliptical sphere.

14. (Canceled)

15. (Original) The localized plasmon resonance sensor according to claim 1, wherein the metal layer comprises Au or Ag.

16. (Currently Amended) A localized plasmon resonance sensor comprising:

a sensor unit having a metal layer with a plurality of convex parts or concave parts formed by fixing metal particles having a diameter of between 10 and 30 nm at an interval of greater than or equal to two times and less than or equal to four times the diameter in average from each other on a surface of a transparent substrate, and molecule recognition functional substance for attaching a specific analyte immobilized on the substrate or the metal layer;

wherein the surface arranged with the metal layer and the molecule recognition functional substances of the sensor unit is contacted to an analysis sample solution containing analyte modified with a light emitting molecule;

an evanescent light generated at the surface of the substrate by an excitation light irradiated at an incident angle totally reflected at the surface of the substrate onto the other surface of the sensor unit and the metal layer Plasmon resonate to locally intensify an electric field around the metal layer; and

presence or concentration of the analyte attached to the molecule recognition functional substance is measured by detecting a luminescent light excited and emitted from the light emitting molecule of the analyte attached to the molecule recognition functional substance among the analytes with the electric field; and

~~The localized plasmon resonance sensor according to claim 1,~~ wherein hydrophilic process, hydrophobic process, or charging process is performed on one region of the substrate or the metal layer, and the molecule recognition functional substances are immobilized at the region not performed with the process.

17. (Currently Amended) A localized plasmon resonance sensor comprising:

a sensor unit having a metal layer with a plurality of convex parts or concave parts formed by fixing metal particles having a diameter of between 10 and 30 nm at an interval of greater than or

equal to two times and less than or equal to four times the diameter in average from each other on a surface of a transparent substrate, and molecule recognition functional substance for attaching a specific analyte immobilized on the substrate or the metal layer;

wherein the surface arranged with the metal layer and the molecule recognition functional substances of the sensor unit is contacted to an analysis sample solution containing analyte modified with a light emitting molecule;

an evanescent light generated at the surface of the substrate by an excitation light irradiated at an incident angle totally reflected at the surface of the substrate onto the other surface of the sensor unit and the metal layer Plasmon resonate to locally intensify an electric field around the metal layer; and

presence or concentration of the analyte attached to the molecule recognition functional substance is measured by detecting a luminescent light excited and emitted from the light emitting molecule of the analyte attached to the molecule recognition functional substance among the analytes with the electric field; and

~~The localized plasmon resonance sensor according to claim 1,~~ wherein the mol concentration of the light emitting molecule is greater than or equal to 100 nM.

18. (Currently Amended) A localized plasmon resonance sensor comprising:

a sensor unit having a metal layer with a plurality of convex parts or concave parts formed by fixing metal particles having a diameter of between 10 and 30 nm at an interval of greater than or equal to two times and less than or equal to four times the diameter in average from each other on a surface of a transparent substrate, and molecule recognition functional substance for attaching a specific analyte immobilized on the substrate or the metal layer;

wherein the surface arranged with the metal layer and the molecule recognition functional substances of the sensor unit is contacted to an analysis sample solution containing analyte modified with a light emitting molecule;

an evanescent light generated at the surface of the substrate by an excitation light irradiated at an incident angle totally reflected at the surface of the substrate onto the other surface of the sensor unit and the metal layer Plasmon resonate to locally intensify an electric field around the metal layer; and

presence or concentration of the analyte attached to the molecule recognition functional substance is measured by detecting a luminescent light excited and emitted from the light emitting molecule of the analyte attached to the molecule recognition functional substance among the analytes with the electric field; and

wherein the [[The]] localized plasmon resonance sensor ~~according to claim 1,~~ further comprises ~~comprising~~ a flow path for flowing the analysis sample solution, wherein the molecule recognition functional substances face the inside of the flow path.

19. (Currently Amended) A localized plasmon resonance sensor comprising:

a sensor unit having a metal layer with a plurality of convex parts or concave parts formed by fixing metal particles having a diameter of between 10 and 30 nm at an interval of greater than or equal to two times and less than or equal to four times the diameter in average from each other on a surface of a transparent substrate, and molecule recognition functional substance for attaching a specific analyte immobilized on the substrate or the metal layer;

wherein the surface arranged with the metal layer and the molecule recognition functional substances of the sensor unit is contacted to an analysis sample solution containing analyte modified with a light emitting molecule;

an evanescent light generated at the surface of the substrate by an excitation light irradiated at an incident angle totally reflected at the surface of the substrate onto the other surface of the sensor unit and the metal layer Plasmon resonate to locally intensify an electric field around the metal layer; and

presence or concentration of the analyte attached to the molecule recognition functional substance is measured by detecting a luminescent light excited and emitted from the light emitting molecule of the analyte attached to the molecule recognition functional substance among the analytes with the electric field; and

~~The localized plasmon resonance sensor according to claim 1,~~ wherein the sensor unit includes a plurality of regions to be introduced with the analysis sample solution, each region being immobilized with the molecule recognition functional substance different from each other.

20. (Original) An examining device comprising a localized plasmon resonance sensor according to claim 1, and a means for analyzing an analysis sample solution based on output data of the sensor.

21. (Previously Presented) A measurement method using a localized plasmon resonance sensor including a sensor unit having a metal layer with a plurality of convex parts or concave parts formed by fixing metal particles having a diameter of between 10 and 30 nm at an interval of greater than or equal to two times and less than or equal to four times the diameter in average from each other on a surface of a transparent substrate and molecule recognition functional substance for attaching a specific analyte immobilized on the substrate or the metal layer; the method comprising the steps of:

forming an analysis sample solution containing analytes modified by a light emitting molecule by mixing a solution to be measured and a light emitting molecule;

contacting the sample solution to the surface arranged with the metal layer and the molecule recognition functional substances of the sensor unit;

generating an evanescent light at the surface of the substrate by irradiating an excitation light at an incident angle totally reflected at the surface of the substrate to a surface not arranged with the metal layer and the molecule recognition functional substances of the sensor unit;

locally intensifying an electric field around the metal layer by Plasmon resonating the evanescent light and the metal layer; detecting emission intensity of the luminescent light excited and generated from light emitting molecule of the analyte attached to the molecule recognition functional substance among the analytes modified with the light emitting molecules in the sample solution with the electric field; and

calculating the presence and the concentration of the analyte from the emission intensity.

22. (Original) The measurement method according to claim 21, wherein the solution to be measured is body fluid of human or animal, and the analyte is a biomolecule including at least one of gene, protein, sugar chain or cell.